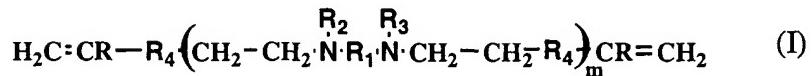


**THAT WHICH IS CLAIMED:**

1. An adduct of a polyfunctional acrylate and an amine terminated polyolefin having the formula:

5



wherein:

R is hydrogen or methyl;

R<sub>1</sub> is a polyolefin;

10 R<sub>2</sub> and R<sub>3</sub> are independently H or substituted or unsubstituted C1-C25 alkyl;

R<sub>4</sub> is an organic group derived from a polyfunctional acrylate and optionally includes side groups formed by the reaction of vinyl groups and amine terminated polyolefins; and

m is from 1 to 30.

2. The adduct according to Claim 1, wherein R<sub>4</sub> is -C(O)-Q, wherein Q is an organic group comprising at least one moiety selected from the group consisting of polyethers, urethanes, epoxies, polyesters, and isocyanates.

3. The adduct according to Claim 1, wherein the polyfunctional acrylate is a polyoxyalkylene acrylate.

4. The adduct according to Claim 3, wherein the polyoxyalkylene acrylate is ethoxylated or propoxylated.

5. The adduct according to Claim 1, wherein R<sub>1</sub> is derived from an amine terminated polyolefin having a molecular weight of from about 1000 to about 200,000.

6. The adduct according to Claim 5, wherein R<sub>1</sub> is derived from an amine terminated polyolefin having a molecular weight of from about 1500 to about 5000.

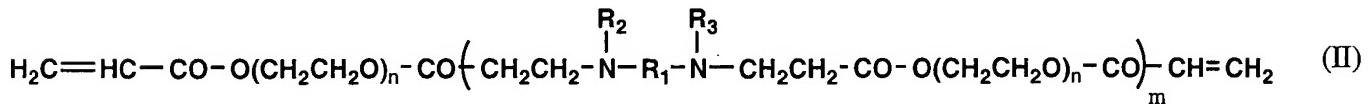
7. The adduct according to Claim 1, wherein R<sub>1</sub> is derived from an amine terminated polyolefin in which at least about 70% of the unsaturated carbon-carbon double bonds are hydrogenated.

8. The adduct according to Claim 1, wherein R<sub>1</sub> is a hydrogenated polybutadiene  
5 or a hydrogenated polyisoprene.

9. The adduct according to Claim 5, wherein said amine terminated polyolefin has a functionality of about 2.0.

10. The adduct according to Claim 1, wherein R<sub>2</sub> and R<sub>3</sub> are both hydrogen.

11. The adduct according to Claim 1, having the formula II:

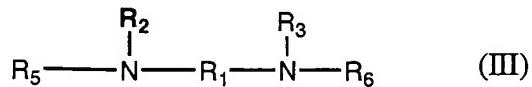


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wherein R<sub>1</sub> is hydrogenated polybutadiene or hydrogenated isoprene, R<sub>1</sub> has a molecular weight of from about 1000 to about 200,000, m is 1 or 2, and n is 1 to 200.

12. The adduct according to Claim 1, wherein the adduct is the reaction product of a polyfunctional acrylate and an amine terminated polymer having the formula III:

15



wherein R<sub>1</sub> is a polyolefin, and R<sub>2</sub>, R<sub>3</sub>, R<sub>5</sub>, and R<sub>6</sub> are each independently H or substituted or unsubstituted C1-C25 alkyl.

13. The adduct according to Claim 12, wherein R<sub>2</sub> and R<sub>5</sub> are not both hydrogen and  
20 R<sub>3</sub> and R<sub>6</sub> are not both hydrogen.

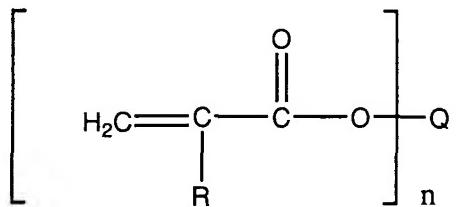
14. The adduct according to Claim 12, wherein R<sub>5</sub> and R<sub>6</sub> are H.

15. The adduct according to Claim 1, wherein the adduct is the reaction product of an amine terminated polymer and a polyfunctional acrylate selected from the group consisting of 1,6-hexanediol diacrylate, 1,4-butanediol diacrylate, ethylene glycol diacrylate, diethylene glycol diacrylate, triethylene glycol diacrylate, tetraethylene glycol diacrylate, tripropylene glycol diacrylate, neopentyl glycol diacrylate, polyethylene glycol diacrylate, 1,3-butylene glycol diacrylate, triisopropylene glycol diacrylate, trimethylolpropane triacrylate, pentaerythritol monohydroxy triacrylate, trimethylolpropane triethoxy triacrylate, pentaerythritol tetraacrylate, di-trimethylol propane tetraacrylate, dipentaerythritol (monohydroxy) pentaacrylate, ethoxylated neopentyl glycol diacrylate, propoxylated neopentyl glycol diacrylate, ethoxylated bisphenol A diacrylate, bisphenol A epoxy diacrylate, hexafunctional aromatic urethane acrylate, aliphatic urethane diacrylate, tetrafunctional polyester acrylate, tris (2-hydroxy-ethyl)isocyanurate triacrylate, and polyether diacrylates.

16. The adduct according to Claim 15, wherein the polyfunctional acrylate is a polyoxyalkylenediacrylate.

15 17. The reaction product of at least one polyfunctional acrylate and at least one amine terminated polyolefin.

18. The reaction product according to Claim 17, wherein said polyfunctional acrylate has the formula



20 wherein R is hydrogen or methyl, n is  $\geq 2$  and Q is an organic group.

19. The reaction product according to Claim 18, wherein n is 2-5.

20. The reaction product according to Claim 19, wherein n is 2.

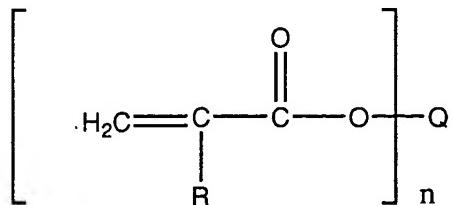
21. The reaction product according to Claim 18, wherein Q is an organic group comprising at least one moiety selected from the group consisting of polyethers, urethanes, epoxies, polyesters, and isocyanates.
22. The reaction product according to Claim 17, wherein said at least one polyfunctional acrylate is a polyoxyalkylene acrylate.
23. The reaction product according to Claim 22, wherein the polyoxyalkylene acrylate is ethoxylated or propoxylated.
24. The reaction product according to Claim 17, wherein said at least one amine terminated polyolefin has the formula III:
- 10
- $$\begin{array}{c} \text{R}_2 \\ | \\ \text{R}_5 - \text{N} - \text{R}_1 - \text{N} - \text{R}_6 \\ | \\ \text{R}_3 \end{array} \quad (\text{III})$$
- wherein R<sub>1</sub> is a polyolefin, and R<sub>2</sub>, R<sub>3</sub>, R<sub>5</sub>, and R<sub>6</sub> are each independently H or substituted or unsubstituted C1-C25 alkyl.
25. The reaction product according to Claim 24, wherein R<sub>2</sub> and R<sub>5</sub> are not both hydrogen and R<sub>3</sub> and R<sub>6</sub> are not both hydrogen.
- 15
26. The reaction product according to Claim 17, wherein the amine terminated polyolefin has a molecular weight of from about 1000 to about 200,000.
27. The reaction product according to Claim 17, wherein at least about 70% of the unsaturated carbon-carbon double bonds of the amine terminated polyolefin are hydrogenated.
- 20
28. The reaction product according to Claim 17, wherein the amine terminated polyolefin is a hydrogenated polybutadiene or a hydrogenated polyisoprene.
29. The reaction product according to Claim 17, wherein the amine terminated polyolefin has a functionality of about 2.0.

30. The reaction product according to Claim 17, wherein the amine terminated polyolefin is a secondary amine.

31. The reaction product according to Claim 17, wherein the polyfunctional acrylate is selected from the group consisting of 1,6-hexanediol diacrylate, 1,4-butanediol diacrylate, 5 ethylene glycol diacrylate, diethylene glycol diacrylate, triethylene glycol diacrylate, tetraethylene glycol diacrylate, tripropylene glycol diacrylate, neopentyl glycol diacrylate, polyethylene glycol diacrylate, 1,3-butylene glycol diacrylate, triisopropylene glycol diacrylate, trimethylolpropane triacrylate, pentaerythritol monohydroxy triacrylate, trimethylolpropane 10 triethoxy triacrylate, pentaerythritol tetraacrylate, di-trimethylol propane tetraacrylate, dipentaerythritol (monohydroxy) pentaacrylate, ethoxylated neopentyl glycol diacrylate, propoxylated neopentyl glycol diacrylate, ethoxylated bisphenol A diacrylate, bisphenol A epoxy diacrylate, hexafunctional aromatic urethane acrylate, aliphatic urethane diacrylate, tetrafunctional polyester acrylate, tris (2-hydroxy-ethyl)isocyanurate triacrylate, and polyether diacrylates.

15 32. A method of making an adduct of a polyfunctional acrylate and an amine terminated polyolefin comprising reacting  $m+1$  moles of a polyfunctional acrylate with  $m$  moles of an amine terminated polyolefin, wherein  $m$  is 1 or greater, under conditions sufficient to produce said adduct.

20 33. The method according to Claim 32, wherein said polyfunctional acrylate has the formula



wherein R is hydrogen or methyl, n is  $\geq 2$  and Q is an organic group.

34. The method according to Claim 33, wherein n is 2-5.

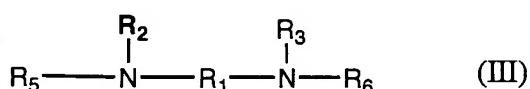
35. The method according to Claim 34, wherein n is 2.

36. The method according to Claim 33, wherein Q is an organic group comprising at least one moiety selected from the group consisting of polyethers, urethanes, epoxies, polyesters, and isocyanates.
37. The method according to Claim 32, wherein said at least one polyfunctional acrylate is a polyoxyalkylene acrylate.

38. The method according to Claim 37, wherein the polyoxyalkylene acrylate is ethoxylated or propoxylated.

39. The method according to Claim 32, wherein said at least one amine terminated polyolefin has the formula III:

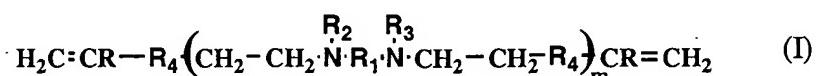
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wherein R<sub>1</sub> is a polyolefin, and R<sub>2</sub>, R<sub>3</sub>, R<sub>5</sub>, and R<sub>6</sub> are each independently H or substituted or unsubstituted C1-C25 alkyl.

40. The method according to Claim 39, wherein R<sub>2</sub> and R<sub>5</sub> are not both hydrogen and  
15 R<sub>3</sub> and R<sub>6</sub> are not both hydrogen.

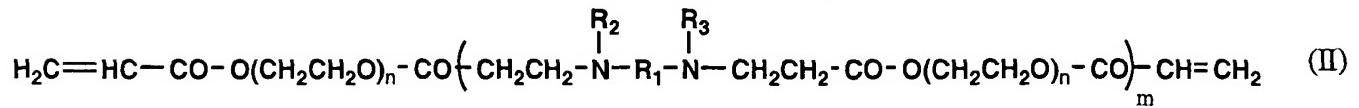
41. The method according to Claim 32, wherein said adduct has the formula:



wherein:

- 20 R is hydrogen or methyl;  
R<sub>1</sub> is a polyolefin;  
R<sub>2</sub> and R<sub>3</sub> are independently H or substituted or unsubstituted C1-C25 alkyl;  
R<sub>4</sub> is an organic group derived from a polyfunctional acrylate and optionally includes side groups formed by the reaction of vinyl groups and amine terminated polyolefins; and  
25 m is from 1 to 30.

42. The method according to Claim 32, wherein said adduct has the formula II:



wherein R<sub>1</sub> is hydrogenated polybutadiene or hydrogenated isoprene, R<sub>1</sub> has a molecular weight of from about 1000 to about 200,000, m is 1 or 2, and n is 1 to 200.

5 43. The method according to Claim 32, further comprising the step of reacting said adduct with a primary polyamine and additional polyfunctional acrylate to cure the adduct.

44. The method according to Claim 43, wherein the primary polyamine is added after the adduct is formed.

10 45. The method according to Claim 43, wherein the primary polyamine is added during the formation of the adduct, with additional polyfunctional polyacrylate.

46. The method according to Claim 32, wherein the amine terminated polyolefin has a molecular weight of from about 1000 to about 200,000.

47. The method according to Claim 46, wherein the amine terminated polyolefin has a molecular weight of from about 1500 to about 5000.

15 48. The method according to Claim 32, wherein at least about 70% of the unsaturated carbon-carbon double bonds of the amine terminated polyolefin are hydrogenated.

49. The method according to Claim 32, wherein the amine terminated polyolefin is a hydrogenated polybutadiene or a hydrogenated polyisoprene.

20 50. The method according to Claim 32, wherein the amine terminated polyolefin has a functionality of from about 1.5 to about 2.0 amine groups per chain.

51. The method according to Claim 32, wherein m is 1 or 2.

52. The method according to Claim 32, wherein excess amine terminated polyolefin or excess polyfunctional acrylate is used in said reacting step to react  $m+1$  moles of said polyfunctional acrylate and  $m$  moles of said amine terminated polyolefin.

53. The method according to Claim 32, wherein the polyfunctional acrylate is selected from the group consisting of 1,6-hexanediol diacrylate, 1,4-butanediol diacrylate, ethylene glycol diacrylate, diethylene glycol diacrylate, triethylene glycol diacrylate, tetraethylene glycol diacrylate, tripropylene glycol diacrylate, neopentyl glycol diacrylate, polyethylene glycol diacrylate, 1,3-butylene glycol diacrylate, triisopropylene glycol diacrylate, trimethylolpropane triacrylate, pentaerythritol monohydroxy triacrylate, trimethylolpropane triethoxy triacrylate, pentaerythritol tetraacrylate, di-trimethylol propane tetraacrylate, dipentaerythritol (monohydroxy) pentaacrylate, ethoxylated neopentyl glycol diacrylate, propoxylated neopentyl glycol diacrylate, ethoxylated bisphenol A diacrylate, bisphenol A epoxy diacrylate, hexafunctional aromatic urethane acrylate, aliphatic urethane diacrylate, tetrafunctional polyester acrylate, tris (2-hydroxy-ethyl)isocyanurate triacrylate, and polyether diacrylates.

54. The method according to Claim 32, further comprising the step of copolymerizing the adduct with at least one acrylic monomer.

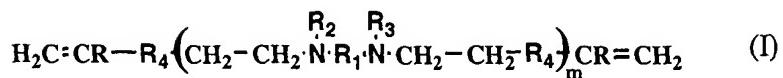
55. The method according to Claim 54, wherein the copolymerizing step is carried out using free radical polymerization.

20 56. The method according to Claim 54, wherein the copolymerizing step is carried out using photopolymerization.

57. The method according to Claim 32, further comprising quaternizing the tertiary amine groups in said adduct by acidification.

25 58. A copolymer derived from an adduct of a polyfunctional acrylate and an amine terminated polyolefin, and at least one acrylic monomer.

59. The copolymer according to Claim 58, wherein said adduct has the formula:

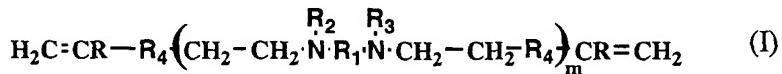


wherein:

- 5      R is hydrogen or methyl;  
R<sub>1</sub> is a polyolefin;  
R<sub>2</sub> and R<sub>3</sub> are independently H or substituted or unsubstituted C1-C25 alkyl;  
R<sub>4</sub> is an organic group derived from a polyfunctional acrylate and optionally includes side groups formed by the reaction of vinyl groups and amine terminated polyolefins; and  
10     m is from 1 to 30.

60. A quaternized adduct of a polyfunctional acrylate and an amine terminated polyolefin.

61. The quaternized adduct according to Claim 60, wherein said adduct before quaternization has the formula



15

wherein:

- R is hydrogen or methyl;  
R<sub>1</sub> is a polyolefin;  
R<sub>2</sub> and R<sub>3</sub> are independently H or substituted or unsubstituted C1-C25 alkyl;  
20     R<sub>4</sub> is an organic group derived from a polyfunctional acrylate and optionally includes side groups formed by the reaction of vinyl groups and amine terminated polyolefins; and  
m is from 1 to 30.